

UTILITY PATENT APPLICATION TRANSMITTAL

April 17, 2000

Attorney Docket No.:	CM03022J	Total Pages:	2
First-Named Inventor or Application Identifier	Steven S. Alterman and Mahesh Bhuta		
Title:	METHOD FOR DYNAMICALLY CONFIGURING GROUP CALLS IN A RADIO SYSTEM		
Express Mail Label No.:			

(Only for new nonprovisional applications under 37 CFR 1.53(b))

APPLICATION ELEMENTS <small>(see MPEP chapter 600 concerning utility patent application contents)</small>	ADDRESS TO:	Assistant Commissioner for Patents Box Patent Application Washington, D.C. 20231
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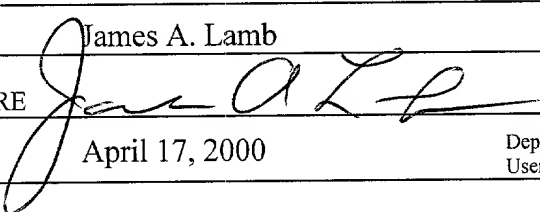
1.	<input checked="" type="checkbox"/>	Fee Transmittal Form <i>in duplicate</i>			
2.	<input checked="" type="checkbox"/>	Specification	Total Pages		17
3.	<input checked="" type="checkbox"/>	Drawings	Total Sheets:		3
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		a. <input checked="" type="checkbox"/> Newly Executed (original or copy)			
		b. <input type="checkbox"/> Copy from prior application (37 CFR §1.63(d)) (for continuation/divisional with Box 17 completed)			
		i. <input type="checkbox"/> <u>Deletion of Inventor(s):</u> Signed statement attached deleting inventor(s) named in the prior application (see 37 CFR §1.63(d)(2) and 1.33(b))			
5.	<input type="checkbox"/>	Incorporation by Reference <i>(useable if Box 4b is checked)</i> The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.			
6.	<input type="checkbox"/>	Microfiche Computer Program (Appendix)			
7.	<input type="checkbox"/>	Nucleotide and/or Amino Acid Sequence Submission			

ACCOMPANYING APPLICATION PARTS

8.	<input checked="" type="checkbox"/>	Assignment Papers <i>(cover sheet and document(s))</i>			
9.	<input type="checkbox"/>	37 CFR §3.73(b) Statement (when there is an assignee)	<input type="checkbox"/>	Power of Attorney	
10.	<input type="checkbox"/>	English Translation Document <i>(if applicable)</i>			
11.	<input checked="" type="checkbox"/>	Information Disclosure Statement (IDS)/PTO-1449	<input checked="" type="checkbox"/>	Copies of IDS Citations	
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15.	<input type="checkbox"/>	Certified Copy of Priority Document(s)
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17.	IF A CONTINUING APPLICATION <i>check appropriate box and supply the requisite information below and in a preliminary amendment:</i>	
	<input type="checkbox"/> Continuation	<input type="checkbox"/> Divisional
	<input type="checkbox"/> Continuation-in-Part (CIP)	Prior Appl. No. _____
Prior Appl. information: Examiner: Group/Art Unit:		

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METHOD FOR DYNAMICALLY
CONFIGURING GROUP CALLS IN A RADIO SYSTEM

TECHNICAL FIELD

5 This invention relates in general to radio communication systems, and more particularly, to a method for dynamically configuring group calls in a radio system.

BACKGROUND

10 Radio talk groups are typically pre-defined and static and can not be changed by any individual subscriber radio user within a radio communication system. In a trunked radio system for example, if a radio is programmed with a particular talk group that is linked to a particular radio
15 channel selection, the radio user can not alter the members assigned to that talk group. Although preprogrammed talk groups are a valuable feature, especially among radio users who work in teams (e.g., building security guards, etc.); preprogrammed talk groups have their limitations.

20 At times it may become desirable for a particular radio user to establish a radio talk group that includes select radio users located in the system. For example, a supervisor may want to speak to a few select subordinates. Some solutions to the above problem have come in different
25 forms. One feature found in trunked radio systems called "Dynamic Regrouping", is a way by which an operator at the fixed-end (e.g., at the central controller) of a radio communication system, can group two or more radio users together. The fixed-end operator can cancel the dynamic
30 regrouping when the radio users no longer need to communicate with each other. The main problem with dynamic

regrouping is that it requires an operator at the fixed-end to set up the group. Although acceptable for private trunked systems (e.g., city fire department system), is not practical in a large public metropolitan radio communication system.

Another solution for providing dynamic talk group is found in U.S. patent 5,471,646, entitled "Method for establishing a user defined radio talk group in a trunked radio communication system", assigned to Motorola, Inc. In the above patent, radio users who want to be part of the same radio talk group all select the same virtual talk group number at their respective radios. Once all of the radio users who want to be part of the virtual group have selected the same virtual talk group number, they all can talk and listen to their group conversation using the assigned virtual talk group. One drawback to this invention is that each of the radio users who wants to be part of the talk group must perform some action, in this case select the same virtual talk group number, to become affiliated with the talk group. This thus requires some coordination between the potential group members prior to the talk group being set up. For example, this may require the potential virtual talk group members to communicate with each other before hand and coordinate when they will all transfer to the virtual talk group. Given the above, a need exists in the art for a method for dynamically configuring a group call by a single device.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention, which are believed to be novel, are set forth with particularity in

the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements, and in which:

FIG. 1 illustrates a block diagram of an exemplary communication system that may beneficially employ the present invention.

FIG. 2 shows a simplified flowchart that highlights the steps taken in accordance with the present invention in order to establish a dynamic group call by a radio user.

FIG. 3 shows a graphical flow diagram showing different exemplary portable radio display contents in accordance with the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

While the specification concludes with claims defining the features of the invention that are regarded as novel, it is believed that the invention will be better understood from a consideration of the following description in conjunction with the drawing figures, in which like reference numerals are carried forward.

Referring now to FIG. 1, there is shown a diagram of a wireless communication system 100 that may beneficially employ the present invention. The communication system 100 includes a system or dispatch controller 110, a plurality of base sites 103-109, a plurality of communication units 120-122, a base site controller ("BSC") 174, a mobile switching center ("MSC") 172 and a dispatch database 164. Each base site 103-109 provides communication service to a

corresponding service coverage area 133-139. The base site service coverage areas 133-139 are grouped into one or more location areas 150-151 (two shown). Each location area 150-151 thus includes one or more of the base site service coverage areas 133-139 and, accordingly, one or more base sites 103-109. Base sites 103-109 communicate using radio frequency signals 162 to radios 120-122. The base sites 103-109 are coupled to a metro packet switch ("MPS") 104 via communications links, such as T1 wireline, fiber optic, microwave links, etc. and preferably communicate using frame relay packet-switching technology.

In the preferred embodiment, the wireless portion of communication system 100 comprises an IDEN[®] radio communication system that is commercially available from Motorola, Inc. of Schaumburg, Illinois. The wireless portion of communication system includes the location areas 150-151, the communication units 120-122, base sites 103-109, the MSC 172, the BSC 174 and the dispatch controller 110.

The Dispatch Application Processor ("DAP") 102 functions to allocate communication resources amongst dispatch service users, such as the users of communication units 120-122 and performs the important function of alerting all members of a dispatch group that a dispatch call is imminently, or presently, underway, so that all members of the dispatch group can participate in the call. The metropolitan packet switch 104 comprises a switch, as well understood in the art, that routes audio signals between sites in order to facilitate the inclusion of group call members that are located in other sites that are also serviced by the radio dispatch system. The dispatch

database 164 is coupled to the dispatch application processor 102 and includes information regarding current dispatch operability states of communication units that are serviced by the radio dispatch system. Such information
5 includes, for example, individual identification (ID), group ID, alias information, roaming status, priority information, and so forth, as is well understood by one of ordinary skill in the art.

The base sites 103-109 preferably support one or more
10 trunking and cellular communications platforms, such as frequency division multiple access (FDMA), time division multiple access (TDMA), or code division multiple access (CDMA). In the preferred embodiment, the base sites 103-109 comprise IDEN Enhanced Base Site Transceiver Sites. The
15 base sites 103-109 are coupled to the metro packet switch 104 via the BSC 174. The BSC 174 is the controlling element between the base sites 103-109 and the MSC 172. The BSC 174 also transcodes the digital VSELP phone calls to pulse code modulation (PCM) to enable communications with a
20 communication network such as the public switched telephone network (PSTN) 170. The MSC 172 provides the interface between the PSTN 170 and the Motorola iDEN radio network. The MSC 172 is the telephone switching office for all calls that are sent or received by subscriber units 120-122.

25 The communication units 120-122 preferably comprise any wireless devices, such as wireless data terminals, radios, radiotelephones, etc., that are capable of receiving and transmitting (transceiving) data packets, or radio dispatch communications, or cellular communications, or any
30 combination thereof. An example of such a communication unit is an IDEN i1000plus portable radio manufactured by

Motorola, Inc. of Schaumburg, IL. In alternative embodiments, one or more of the communication units 120-122 may comprise a data terminal coupled to a wireless communication device. The communication units 120-122 are alternatively referred to herein as radios 120-122. The system controller 110 preferably comprises an IDEN Dispatch Application Processor 102 and a metro packet switch 104. The dispatch database 164 is coupled to the DAP 102 as shown.

10 When each communication unit 120-122 is initially activated, it registers with the controller 110 by first identifying a serving base site from control channel transmissions of all the base sites 103-110, as is well known in the art. Then the unit transmits a registration
15 message to the controller 110 via the identified serving base site. Upon receiving the registrations, the controller 110 affiliates each communication unit 120-122 with its serving base site and the location area that includes the service coverage area of the serving base site. The
20 controller 110 then stores the registrations in the dispatch database 164.

As is well known in existing IDEN radio communication systems, when a mobile radio (e.g., 122) desires to engage in a dispatch call such as a group call with one or more
25 mobile communication units, the requesting communication unit 122 transmits a request to communicate to its serving base site 108 over a control channel. The request to communicate includes the dispatch IDs of the requesting communication unit 122 and the communication unit (e.g.,
30 121) or dispatch group that is the intended target of the

desired communication, and identifies each communication unit as either a requester or target as is well known.

Upon receiving the request at the base site 108, the base site 108 provides the request to the controller 110.

5 The controller 110 queries the dispatch database located either within the controller 110 or external to the controller 110 to determine which location area(s) currently contain the target communication unit(s). Once the controller 110 locates the target communication unit(s), the
10 controller 110 attempts to contact the target communication unit(s) as is well-known in the art and proceeds to establish a communication path between the requesting communication unit and the target communication unit(s) to support the call.

15 The controller 110 can support a radio dispatch operational mode that handles both individual dispatch calls such as private calls between two communication units, as well as group dispatch calls. The dispatch mode operates much like a wide-area walkie-talkie radio call and uses
20 push-to-talk (PTT) to gain almost instantaneous voice access to individuals and groups. Unlike a cellular phone, a dispatch call has almost no setup time because it does not require dial up access to a mobile switch center (MSC) and the public switched telephone network (PSTN). The controller
25 110 also supports a packet data mode of operation.

In accordance with the present invention, using packet data and the Internet Protocol (IP) address assigned to each iDEN subscriber radio 120-122, a single radio user or any Internet appliance can configure group calls dynamically on
30 the fly. The radio user (dynamic group call originator) will be able to select radio users using aliases (e.g., user

names, etc.) and/or IP addresses from a list stored within the subscriber radio 120-122. When all of the required users are selected from the list, special packet data messages are sent to each of those selected radios (one message sent to each of the selected radios). The special packet data message will then cause the "target" subscribers to switch to an assigned reserved talk group number, where the dynamic group call will proceed. An additional feature of the present invention includes an optional acknowledgment by each of the target radios to the special packet data message. These acknowledgment messages by each of the target radios gives the dynamic group call originator the ability to track which radios (IP addresses) responded and participated in the group call and which radios did not respond.

Referring now to FIG. 2, there is shown a simplified flow chart showing the steps taken in order for a particular radio user to establish a dynamic group call in accordance with the invention. In step 202, the originator of the group call, for example the user of radio 122; selects the group members (radio users, also referred to as target radios) he wants to participate in the group call. This is accomplished by the user of radio 122 scrolling through a list of radio users stored in radio 122. This list preferably includes the IP addresses of all of the radios in the list as well as an alias that can help identify each of the radio users, for example, the name of the user.

Once all of the dynamic talk group members have been selected in step 202, in step 204 the radio 122 ("dynamic group call originator") transmits dynamic group call set up messages using packet data to each of the selected target

radios, for example radios 120, 121. These messages are preferably all automatically sent by radio 122, although they could be sent one at a time at the option of the user of radio 122. Optionally in step 206, upon radios 120 and 121 receiving the dynamic group call message addressed to each of the radios, they individually acknowledge the dynamic group call message received by sending an acknowledgment message back to radio 122. This allows radio 122 to track which radios that had been selected will participate in the dynamic talk group call.

In step 208, once the dynamic group call messages have been received by each of the target radios, radios 120, 121, they each switch to the specific dynamic talk group number assigned by the dynamic group call message sent by radio 122. Once the radio 122 and the target radios 120, 121 have switched to the assigned dynamic talk group, the group call can proceed as normal. In accordance with the invention, the originating radio 122 sends dynamic group call disconnect messages at step 210 to each of the radios 120, 121 in the dynamic talk group in order to disconnect the dynamic talk group. Alternatively, or in addition to, the ability of the originating radio 122 to send disconnect messages, the controller 110 can send a "hangtimer" disconnect message if there has been no activity by any of the radios in the dynamic talk group 120-122 after a predetermined period of time has elapsed, or if the dynamic group call has exceeded a predetermined period of time.

It is worth noting that since the dynamic group call setup in accordance with the invention uses packet data and the IP address information to set up the participating radios in the dynamic group call, that not only can a

subscriber radio in the system 100 set up a dynamic talk group call, but any communication device (e.g., computer 176, etc.) connected to the communication system 100 can set up the call. For example, a computer coupled through the
5 PSTN 170 via the MSC 172 could send dynamic group set up messages to select radios in the system in order to establish a group call.

In FIG. 3, there is shown a graphical illustration of some of display screens shown to a radio user who wants to
10 set up a dynamic group call in accordance with the present invention. Radio 120 includes a display 302, which functions as a user interface that allows the radio user to select the dynamic talk group features and select the target member(s) for the group call.

15 When a radio user wants to set up a dynamic talk group he scrolls through the radio feature menu until he reaches the dynamic talk group feature as shown in display 304. Once the dynamic talk group feature is selected, a set up group screen 306 is presented to the radio user. The user
20 then scrolls through the list and selects all of the people he wants to include in his dynamic group call. This screen also allows the radio user to enter an IP address for one or more target radios that are not found in the list.

Once all of the dynamic group members have been
25 selected, the user exits the set up screen 306 and a select talk group identification (ID) screen 308 is presented. A default talk group ID (e.g., 99, etc.) is presented to the user or the user can select from a list of talk group IDs which have been specifically assigned to the system 100 for
30 the purposes of establishing dynamic talk groups. After the talk group ID number has been selected, a transmit

dynamic talk group screen 210 is presented to the user, in order for the user to cause radio 120 to transmit dynamic talk group setup messages to each of the target radios (e.g., 121, 122) using their IP addresses. Alternatively,
5 the setup messages can be transmitted automatically after the dynamic talk group ID number is selected.

In another embodiment of the invention, the system controller 110 can assign the dynamic talk group ID to the dynamic group call originator in order to reduce system
10 contention. In this embodiment, the dynamic group call originator can send a request in to the system controller 110 in order to reserve a dynamic talk group ID, prior to or in association with the dynamic talk group message(s) being transmitted by the dynamic talk group originator.

15 Other user control screens can include a screen that shows which of the target radios acknowledged the talk group set up message sent by radio 120, and a screen for allowing the radio 120 to transmit a dynamic talk group call disconnect message to each of the radios participating in
20 the group call.

As has been discussed above, the present invention uses IP addresses of radios 120-122 to send messaging, preferably using packet data that sets up a dynamic talk group. The radios 120, 121 can also in accordance with the invention
25 inform the originator of the dynamic talk group that they do not want to participate by sending to the originator a message. The radios 120-122 can also setup and breakdown a dynamic talk group they have created as previously discussed. By giving an individual device, for example
30 radio 120 or computer 176 coupled to a packet data radio through the PSTN 170 (FIG. 1), the ability to set up a

dynamic talk group independently and without the need for action from the communication system 100, provides for improved communication flexibility is provided for the communication system users.

5 While the preferred embodiments of the invention have been illustrated and described, it will be clear that the invention is not so limited. Numerous modifications, changes, variations, substitutions and equivalents will occur to those skilled in the art without departing from the
10 spirit and scope of the present invention as defined by the appended claims.

CLAIMS

1. A method for establishing a dynamic talk group in a radio communication system having a plurality of radios each
5 having a unique Internet Protocol (IP) address, comprising the steps of:
- (a) selecting a set of target radios from amongst the plurality of radios by a dynamic group call originator;
 - 10 (b) transmitting a message from the dynamic group call originator to each of the set of target radios whose IP addresses match those radios selected in step (a); and
 - (c) causing the target radios and the dynamic group
15 call originator to establish a dynamic talk group where the dynamic group call will take place.
2. A method as defined in claim 1, wherein the dynamic group call originator comprises a radio from amongst
20 the plurality of radios located in the radio communication system.
3. A method as defined in claim 1, wherein the message
25 transmitted to each of the target radios in step (b) comprises a packet data message.

4. A method as defined in claim 1, further comprising the further step of:

5 (d) transmitting an acknowledgment message to the dynamic group call originator from each of the target radios that successfully received the message transmitted in step (b).

10 5. A method as defined in claim 1, comprising the further step of:

15 (e) transmitting a dynamic talk group disconnect message by the dynamic group call originator to the target radios.

6. A method as defined in claim 5, comprising the further step of:

20 (f) disconnecting the target radios from the dynamic group call in response to step (e).

7. A method as defined in claim 1, wherein at least one of the target radios in response to step (b) transmits a
25 message to the dynamic group call originator informing it that it is not available to participate in the dynamic talk group.

8. A method for establishing a dynamic talk group in a radio communication system having a plurality of radios each having a unique Internet Protocol (IP) address, comprising
5 the steps of:

- (a) selecting a first target radio and a second target radio from amongst the plurality of radios by a dynamic group call originator;
- 10 (b) transmitting a first message including the first target radio's IP address from the dynamic group call originator to the first target radio and a second message including the second target radio's IP address from the dynamic group call originator to the second target radio; and
- 15 (c) causing the first and second target radios and the dynamic group call originator to establish a dynamic talk group where a dynamic group call will take place once the dynamic group call originator has transmitted the first and second messages.

20

9. A method as defined in claim 8, wherein the dynamic group call originator comprises a communication device coupled to the radio communication system.

25 10. A method as defined in claim 9, wherein the communication device comprises a computer coupled to the radio communication system via a communication network.

11. A method as defined in claim 8, wherein the dynamic
group call originator comprises a radio amongst the
plurality of radios located in the radio communication
5 system.

12. A method as defined in claim 8, further comprising the
step of:

(d) disconnecting the dynamic talk group.
10

13. A method as defined in claim 12, wherein step (d) is
performed by the dynamic group call originator transmitting
disconnect messages to each of the first and second target
radios.

14. A method as defined in claim 12, wherein the radio
communication system includes a system controller and step
(d) comprises the system controller sending disconnect
messages to each of the first and second target radios and
15 the dynamic group call originator.
20

15. A method as defined in claim 14, wherein the system
controller sends the disconnect messages when it determines
that the dynamic group call has exceeded a predetermined
25 period of time.

16. A method as defined in claim 14, wherein the system
controller sends the disconnect messages when it determines
that a predetermined period of time has elapsed without any
30 communication activity occurring in the dynamic talk group.

METHOD FOR DYNAMICALLY
CONFIGURING GROUP CALLS IN A RADIO SYSTEM

ABSTRACT OF THE DISCLOSURE

5 A method for setting up a dynamic group call includes
the step (202) of selecting a group of radios (120, 121) by
a dynamic group call originator (122). Once the radios that
will be part of the dynamic group have been selected, the
dynamic group call originator (122) transmits a dynamic
10 group call message(s) to each of the selected radios. Each
of the transmitted dynamic group call message(s) includes
the IP address of one of the selected radios. Upon each of
the target radios receiving their individually directed
message, the target radios (120, 121) can each send an
15 optional acknowledgment message to the dynamic group call
originator (122). The originator (122) and the target
radios (120, 121) then switch to the dynamic talk group
number assigned by the dynamic talk group message. Once the
dynamic talk group call has been completed, the originator
20 of the dynamic group call can send a dynamic group call
disconnect message, which once received by the target radios
(120, 121) causes them to revert back to their previous
operational state. Alternatively, instead of the dynamic
talk group originator transmitting a disconnect message, the
25 radio communication system controller (110) can transmit a
disconnect message such as based on a timer (e.g.,
hangtimer, etc.).

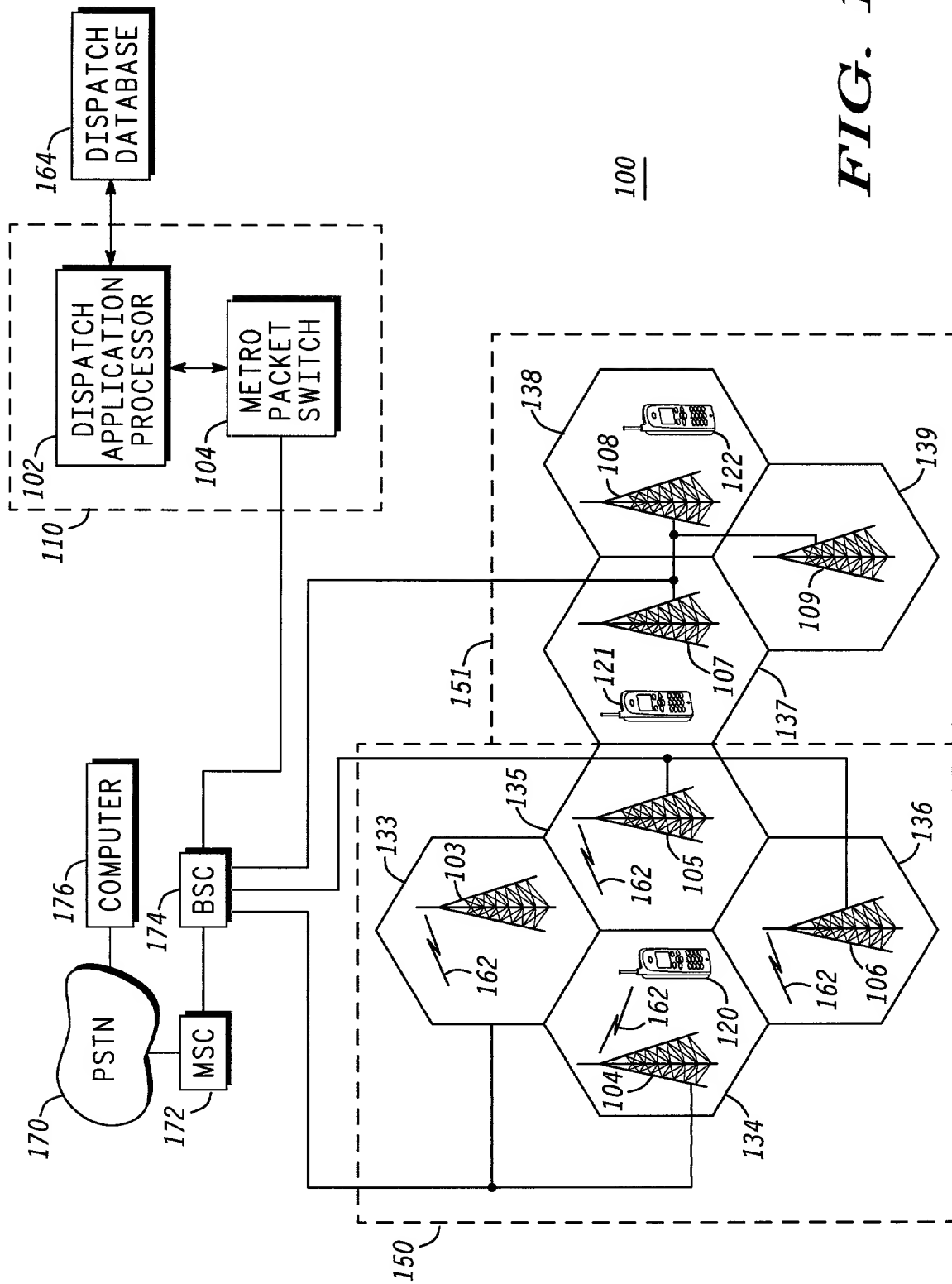
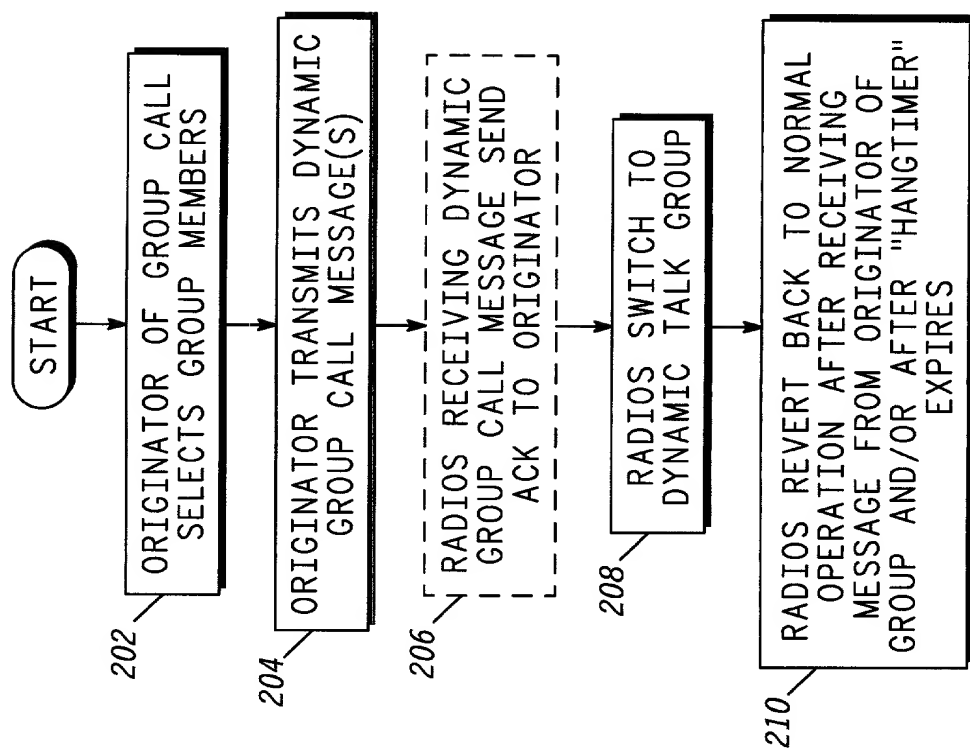


FIG. 1

**FIG. 2**

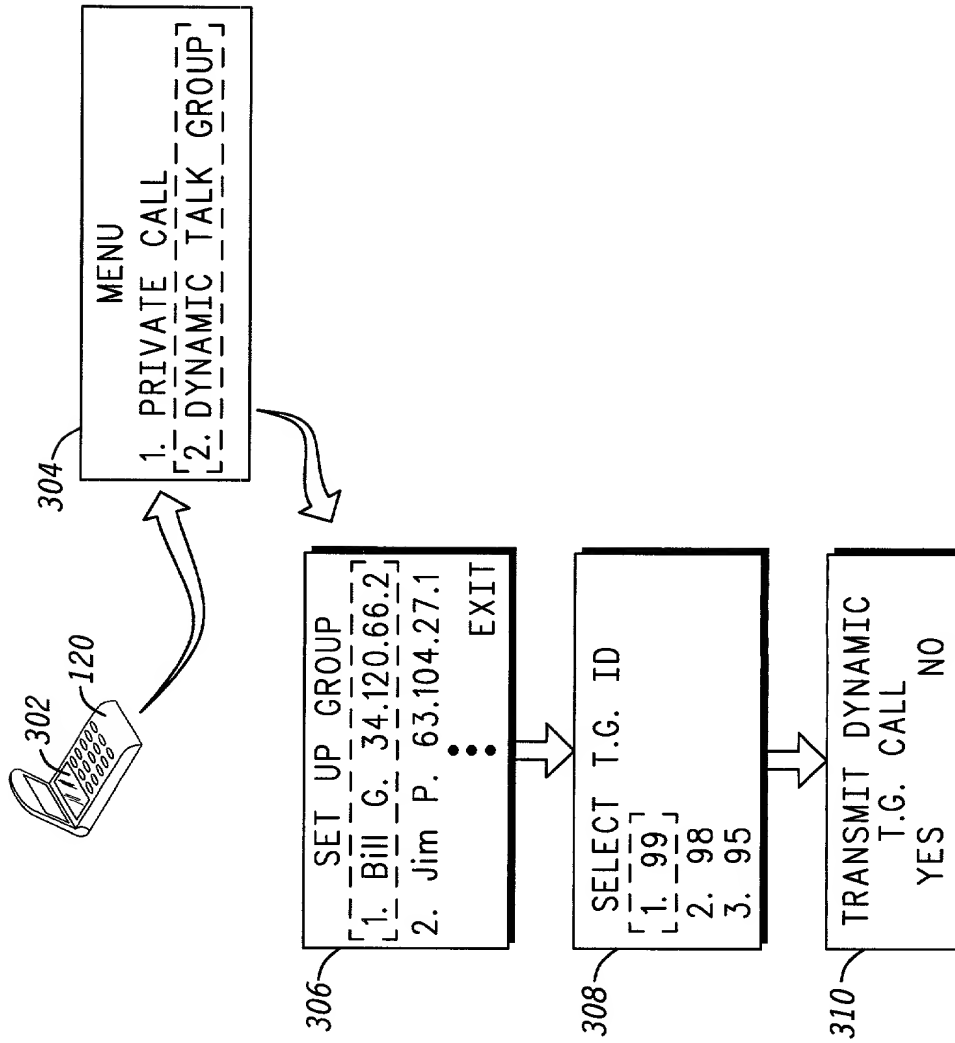


FIG. 3

PATENT APPLICATION DECLARATION
COMBINED WITH POWER OF ATTORNEY

Attorney's Docket No.: CM03022J



Regular (Utility)



Design Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR DYNAMICALLY CONFIGURING GROUP CALLS IN A RADIO SYSTEM

the specification of which:



is attached hereto



was filed on: _____

as U.S. Serial No.: _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign/PCT Application(s):



no such application(s) filed



such application(s) identified as follows:

Application Number	Country	Date of Filing (day, month, year)	Priority Claimed Under 37 U.S.C. 119
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

Provisional Application Serial No.: _____

Provisional Application Filing Date: _____

I hereby claim the priority benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which is material to the patentability of this application and which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. Application(s):



no such application(s) filed



such application(s) identified as follows:

Application No.	Filing Date (day, month, year)	Status (Patented, Pending, Abandoned)

I hereby declare that: as to any claimed subject matter of this application which is common to my earlier United States or foreign application(s), if any, which I have identified above and claimed the benefit of priority thereof, I do not believe that the same was ever known or used in the United States before my invention thereof or patented or described in any printed publication in any country before my invention thereof or more than one year prior to the first of said earlier application(s), or in public use or on sale in the United States more than one year prior to the first of said earlier application(s), and that the said common subject matter has not been patented or made the subject of an inventor's certificate before the date of the first of said earlier U.S. application(s) in any country foreign to the United States on an application, filed by me or my legal representatives or assigns more than twelve months (six months if the present application is a Design patent application) prior to the first of said earlier U.S. application(s), if any; and that, as to any claimed subject matter of this application which is not common to said earlier application(s), if any, I do not know and do not believe that the same was ever known or used in the United States before my invention thereof or patented or described in any printed publication in any country before my invention thereof or more than one year prior to the date of this application, or in public use or on sale in the United States more than one year prior to the date of this application, and that said subject matter has not been patented or made the subject of an inventor's certificate in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months (six months if the present application is a Design patent application) prior to the date of this application.

I HEREBY APPOINT THE FOLLOWING AS MY ATTORNEY(S) OR AGENT(S) WITH FULL POWER OF SUBSTITUTION TO PROSECUTE THIS APPLICATION AND TRANSACT ALL BUSINESS IN THE PATENT AND TRADEMARK OFFICE CONNECTED THEREWITH:

NAME(S)	REG. NO.(S)	ASSOCIATE POWER OF ATTORNEY ATTACHED	
Steven G. Parmelee	28,790	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
J. Ray Wood	36,062	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Daniel K. Nichols	29,420	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Val Jean F. Hillman	34,841	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
M. Mansour Ghomeshi	35,155	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Frank M. Scutch, III	34,484	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Lesley A. Rhyne	34,909	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Andrew S. Fuller	37,328	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dale W. Dorinski	35,122	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Barbara R. Doutre	39,505.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Scott M. Garrett	39,988	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
James A. Lamb	38,529	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Felipe J. Farley	38,445	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

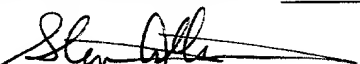
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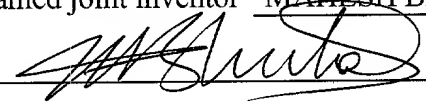
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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